

WELCOME TO THE GRADER PHASE



Interservice Training Review Organization



Safety

- Violations will terminate attendance.
- Remove all jewelry, such as rings, watches, ID tags and necklaces.
- Notify your instructor if you are taking any medication.
- Horseplay will not be tolerated. Careless acts such as throwing rocks, snowballs, or any projectiles will constitute severe academic/administrative action.

Safety

- Safety helmets, hearing protection, and seatbelts will be utilized as required.
- As an operator, when being approached by another student or instructor, you will place the directional control lever / transmission in neutral, set the parking brake, reduce the RPMs to idle and place your hands on top of your safety helmet.
- Always operate the grader in first gear.

Safety

- Never back the grader with the governor control lever engaged.
- Learn and adhere to all hand signals Wear safety goggles and gloves when checking batteries, hydraulic tank and fueling grader.
- Ground all attachments before dismounting.
- Use caution when working on hills, banks or slopes to avoid tipping.

Frostbite/Heat Stress:

- Take precautions as appropriate to avoid injuries.
- Let the instructor know if you have been a casualty.
- Hydrate early in the day, regardless of the season.

Flags		Work / Rest	
• Green –	Cat 2	50min	10min
• Yellow –	Cat 3	40min	20min
• Red –	Cat 4	30min	30min
• Black –	Cat 5	10min	50min

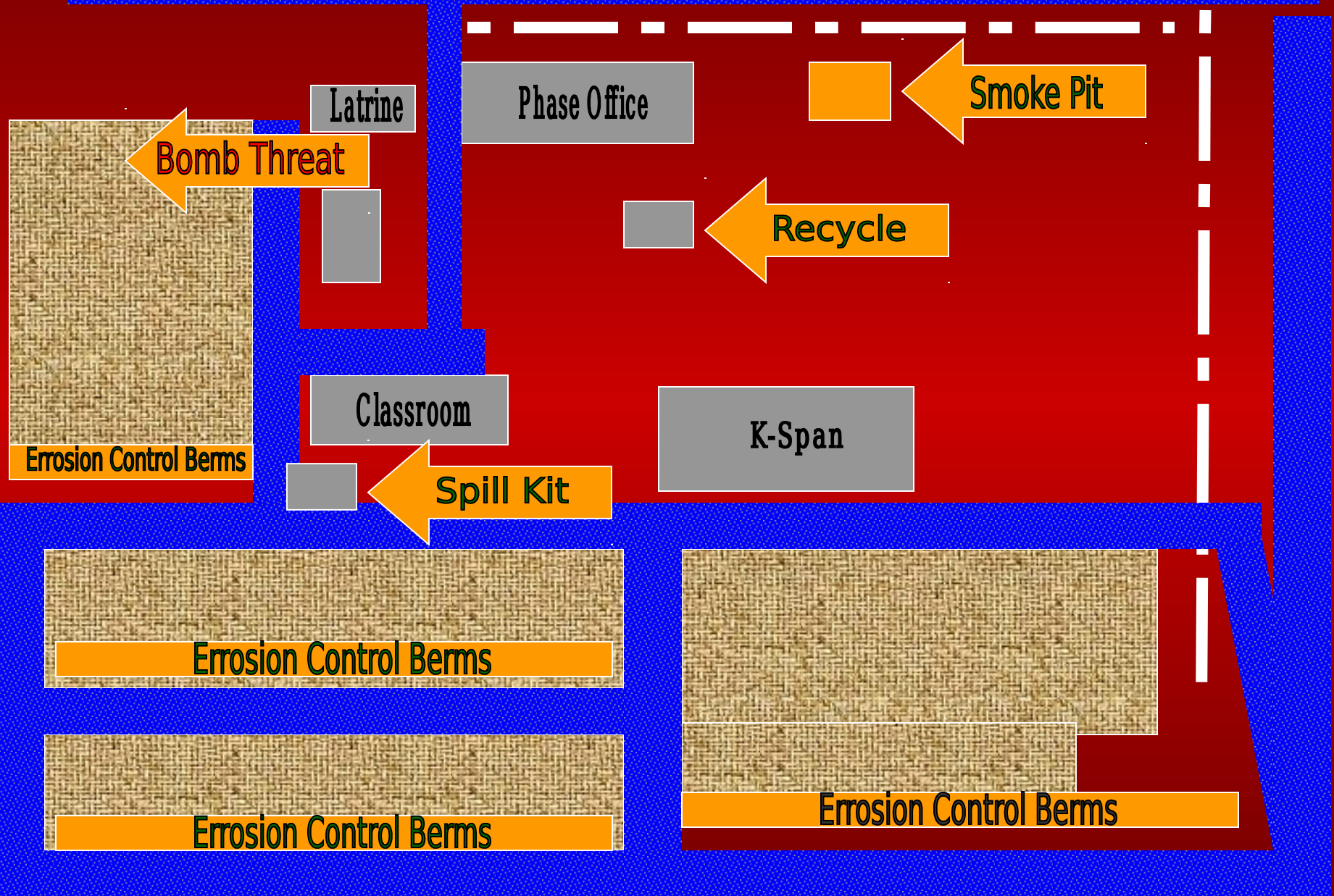
Grader Phase Introduction **Latrines / Facilities**

- The latrines will be taken care of or they will be placed off limits and port-a-potties utilized.
- Do not use tobacco products in the latrines.
- No graffiti, do not write on the walls.
- Warm-up shed.
- Tool shed.
- POL shed.
- Water faucet/boot wash.

BREAK AREA / GUT TRUCK

- **All snacks will be eaten in the break area. No snacks in the training area or class room.**
- **Garbage from the Gut truck will not be thrown in the latrine garbage can.**
- **Sunflower seeds are not authorized on the Grader Phase.**
- **Police up or lose you privilege**

Grader Phase Introduction



Chain of Command

- Student class leader.
- Instructor.
- Phase chief.
- Course chief.
- Division chief.

Critiques

- A course critique will be administered on day 8 of training.
- The purpose of the critique is to highlight deficiencies and praise accomplishments.
- If you are dissatisfied while you are at our phase, try to work it out at the lowest possible level. Use your Chain of Command

Standards of Conduct

- Professionalism (respect for rank and each other).
- Training area and classroom:
 - Stay awake during the lectures.
 - No sleeping during breaks.
 - Raise hand to ask a question.
 - Ensure that you get your instructors permission prior to leaving classroom or training area.

Responsibilities of Class Leaders

- **Report to the phase office each morning with FLW Form 880.**
 - Unit
 - Date
 - Class Number
 - Personnel Assigned
 - Personnel Present
 - List all personnel not present and coded
 - Ensure a point of contact is listed on the reverse side of the form.

****NOTE****

Students returning from an appointment will report to the phase office and check in.

Responsibilities of Class Leaders

- **Maintain Control**
- **Maintain Uniformity**
- **Report problems (Use the Chain of Command)**
- **Class Clean-up**

**WELCOME TO THE
GRADER PHASE**



***Interservice
Training Review
Organization***



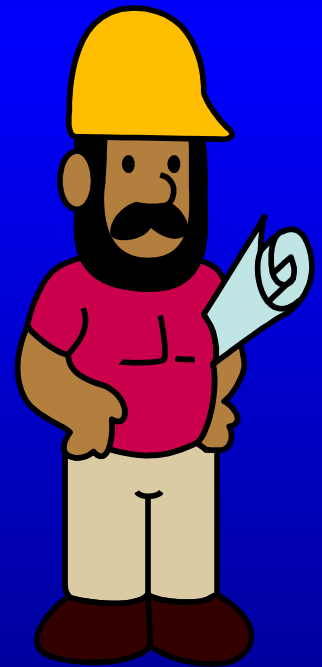
SCOPE

The purpose of this lesson is to familiarize the student with a basic understanding of the characteristics, capabilities, limitations and components of a motorized grader.

SAFETY REQUIREMENTS: No major considerations

RISK ASSESSMENT: Low

ENVIRONMENTAL CONSIDERATIONS: No major considerations



NOMENCLATURE

- Grader, heavy road, motorized.

Grader Phase Introduction

Heavy Motorized Road Grader Caterpillar 130G



Grader Phase Introduction

Heavy Motorized Road Grader

Champion 700 Series



Grader Phase Introduction

Heavy Motorized Road Grader John Deere 670



Heavy Motorized Road Grader

Functions and Capabilities:

- **Primary finishing equipment**
 - Ideal for finishing grade on projects
 - Precise final shaping
- **Level earth already moved into position by bulldozers and scrapers**
 - Perform light stripping and leveling minor ground irregularities
 - Perform road and runway maintenance
- **Mix and spread material**
 - Used to mix bituminous and other material

Heavy Motorized Road Grader

- **Functions and Capabilities:**
 - **Light scarifying**
 - **High bank sloping; for slopes $< 3:1$
use high bank slope position**
 - **V and flat bottom ditch**
 - **Snow Removal**



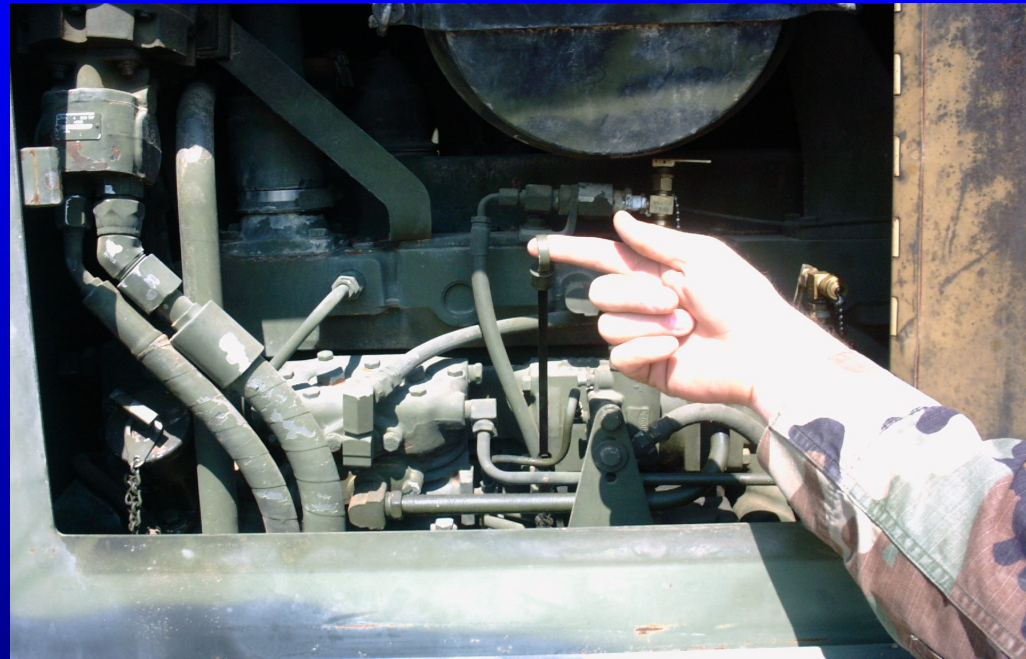
Limitations

- **The grader itself is restricted to working on slopes no greater than 3:1**
- **In muddy conditions the grader loses traction, which causes decreased grader efficiency**
- **The grader is also restricted to making shallow cuts in medium-hard material; it should not be used for heavy excavation**

Major Operating Components

Diesel powered engines

- Powered by a four or six cylinder, turbo-charged, diesel engine
- Oil lubricated, proper level checked by a dipstick
- Hot and cold check on most graders
- Level “OK” between the add /full marks
- Allow engine to warm-up and cool down, 3 to 5 minutes



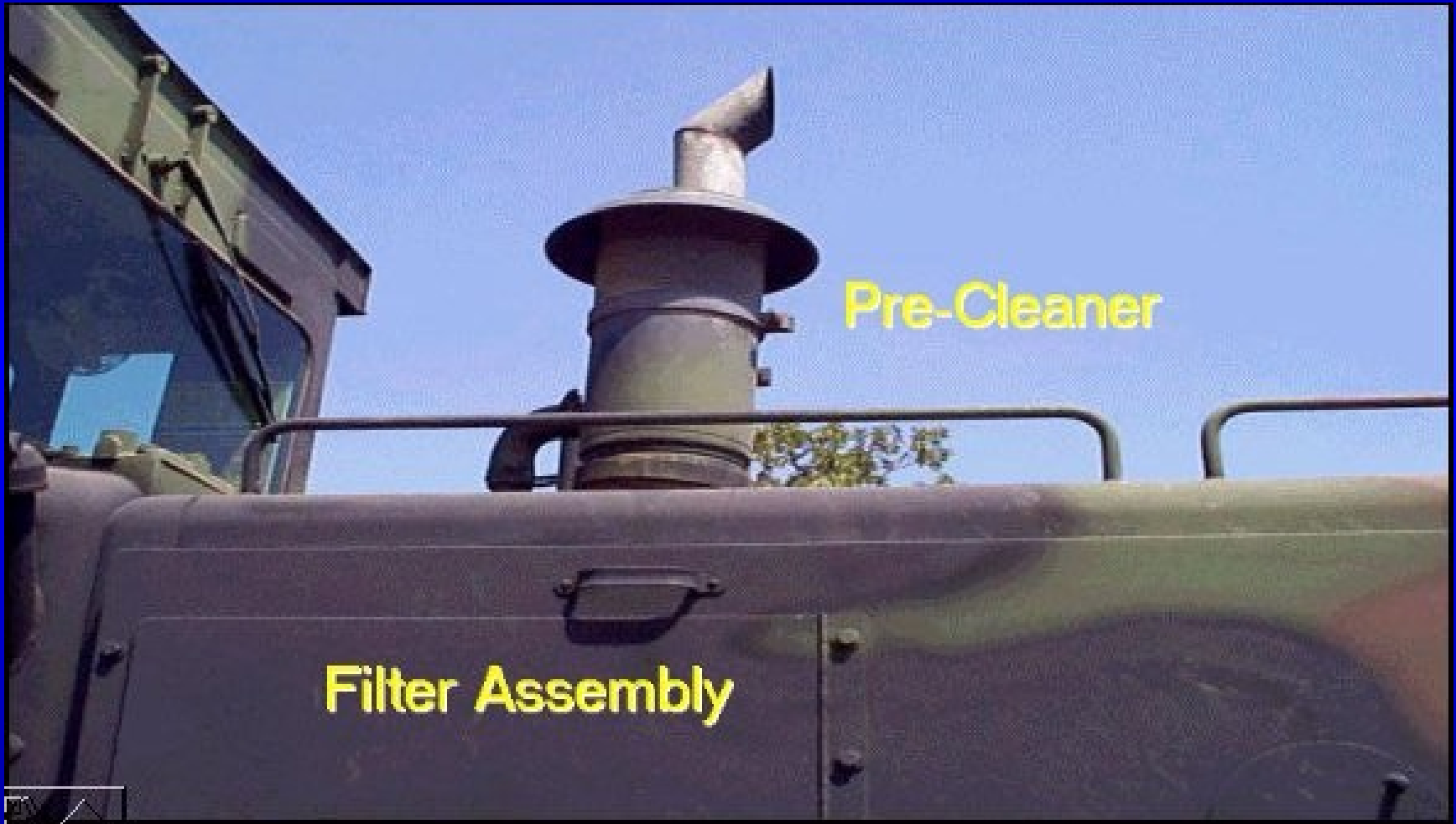
Major Operating Components

Water Cooled



Major Operating Components

Air Induction System



Major Operating Components

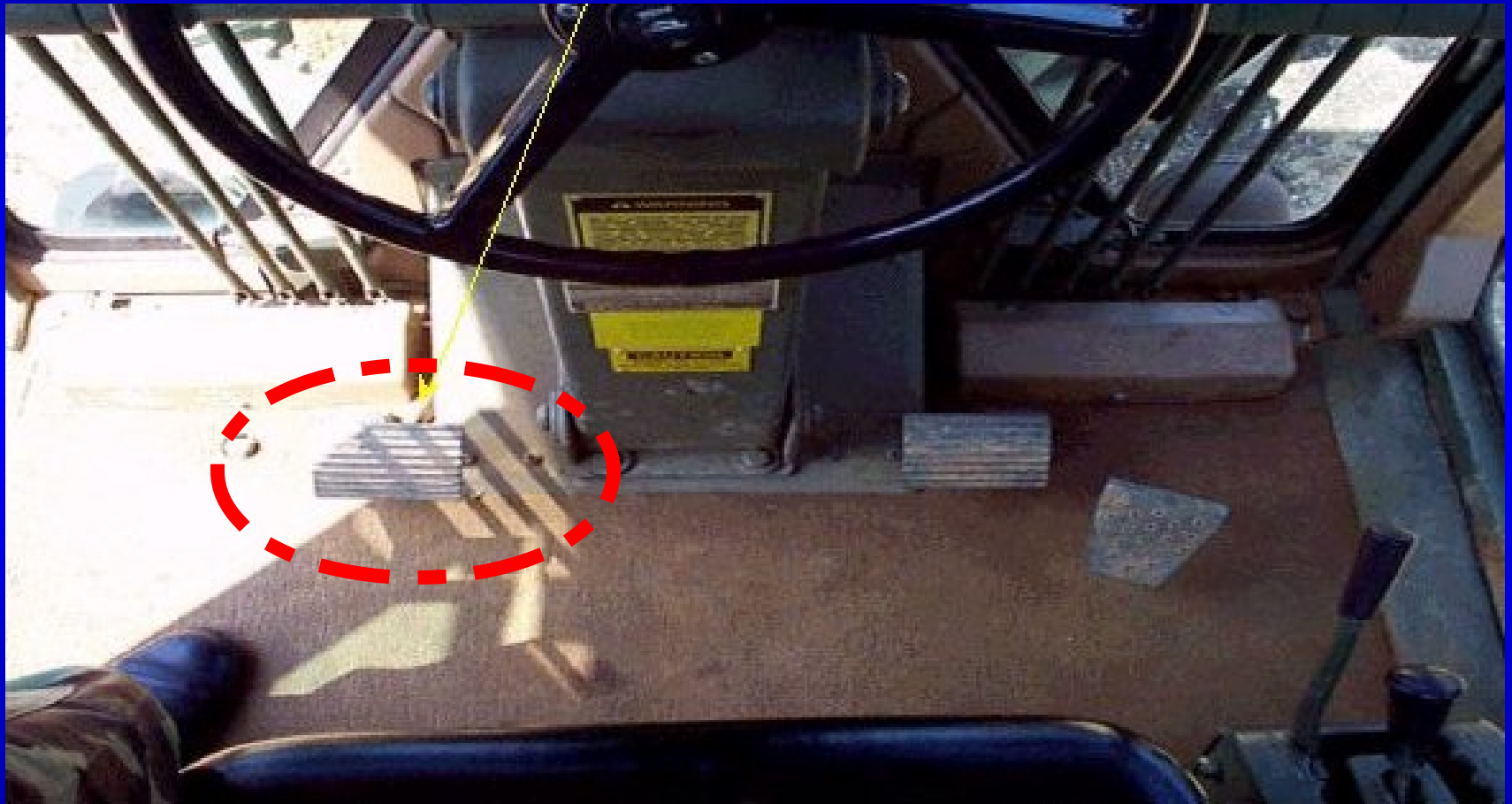
Transmission



Full power-shift, hydraulically powered transmission with multiple speed settings.

Major Operating Components

Clutch / Inching Pedal / Modulator



Utilized to place grader in motion.

Utilized to stop grader in conjunction with the br

Major Operating Components

Wheels and Tires



Tire Pressure 35

PSI

V-shaped tire is self cleaning which aids

Split-ring could cause personal injury.

Major Operating Components

Tandem



Major Operating Components

Tandem



Locking differential restricts the turning radius.

Major Operating Components

Review

Functions

Major Operating Components:

- **Engine**
- **Transmission**
- **Clutch**
- **Wheel / Tires**
- **Tandems**

Components

Scarifier Log



Capable of light scarifying with a front mounted V-t

Component

Scarifier Log



Maximum number of teeth are used for moderate to hard

Minimum number of teeth are used for hard to ve

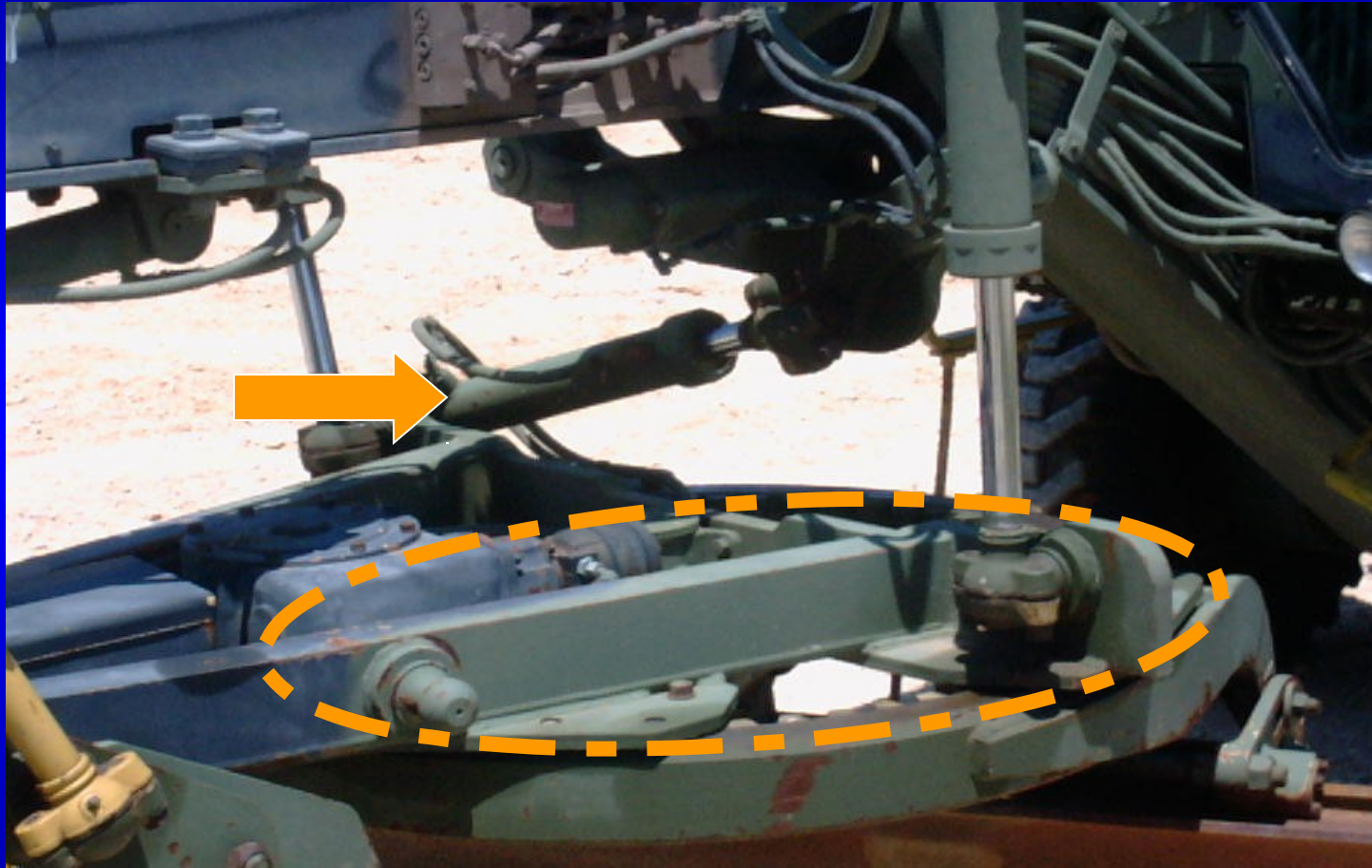
Components

Mold Board



Components

Circle



A table-top apparatus to which the moldboard is
The Center Shift Cylinder moves the circle left a

Components

ts

Blade Pitch



All the way FORWARD for a mixing action.

Components

ts

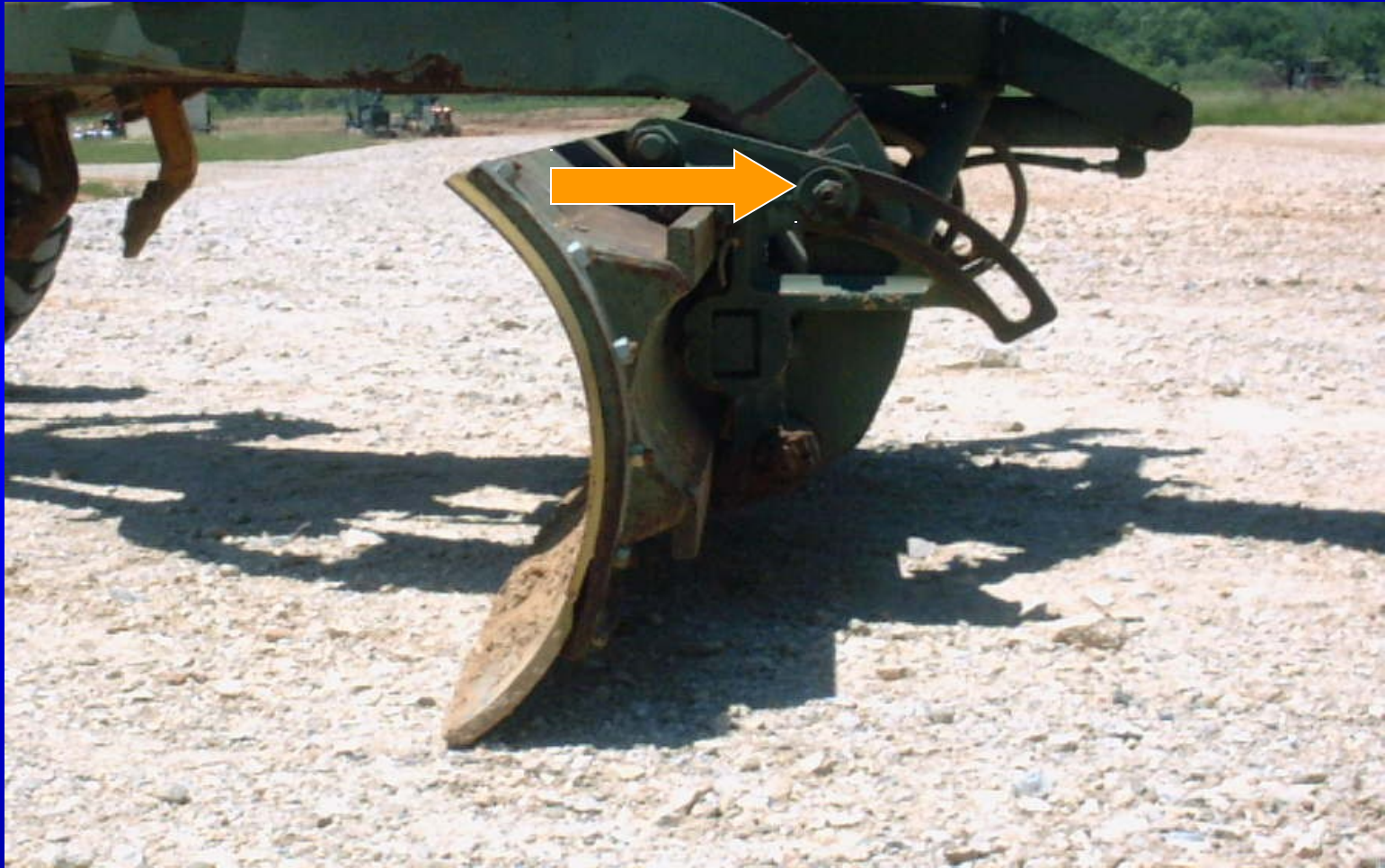
Blade Pitch



HALF WAY for general grading action.

Components

ts
Blade Pitch



All the way BACK for a cutting action.

Components

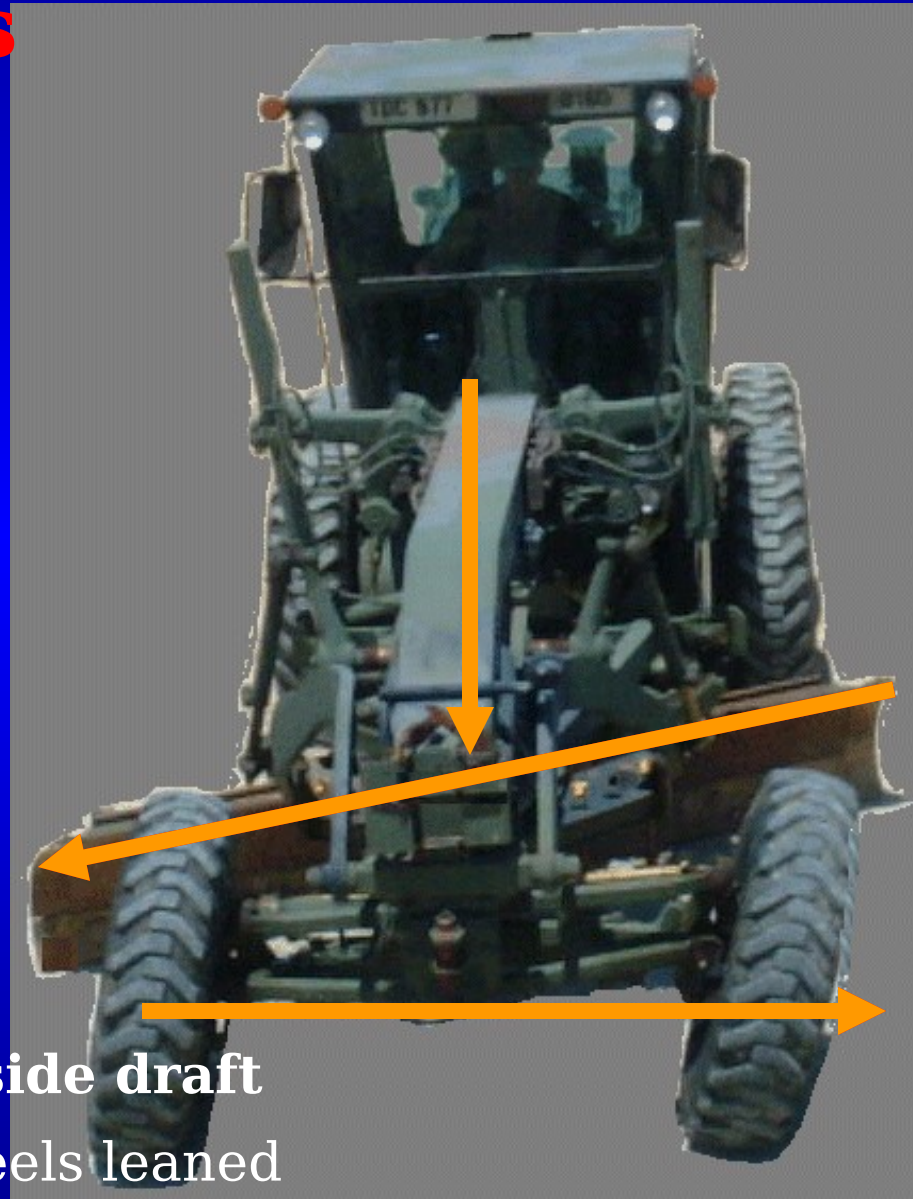
Blade Side Shift



A cylinder positioned parallel, attached to the back of the moldboard. Slides the moldboard left or right providing greater

Components

Wheel Lean



Wheel lean is used to minimize side draft
Never back the grader with the wheels leaned

Components

Steering



Straight Framed

Components

Steering



Articulated

Components

Steering



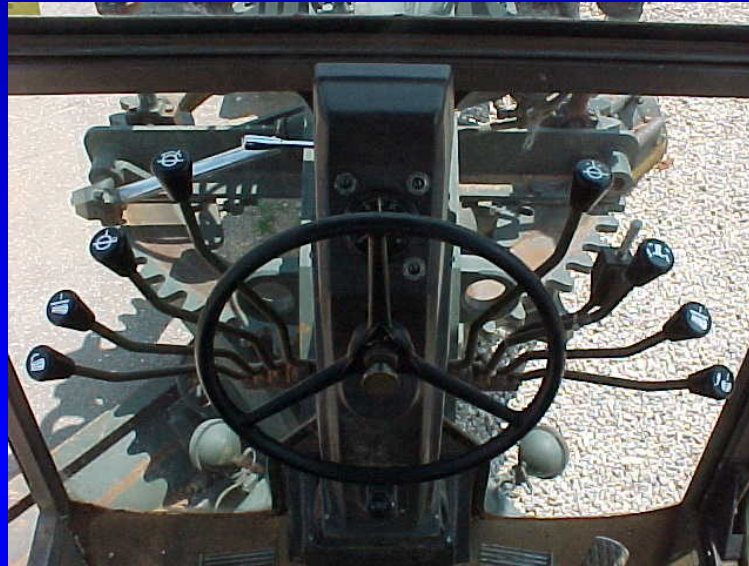
Crab Mode

Components Review

- Scarifier Log
- Moldboard
- Circle / Center Shift
- Blade Pitch
- Blade Side Shift
- Wheel Lean
- Steering Modes

Controls

Champion



Caterpillar



John



Hand Signals

Coordinated Blade End Movement



Hand Signals

Raise and Lower End of Blade



Hand Signals

Circle Blade



Hand Signals

Blade Side Shift / Slide Blade



Hand Signals

Scarifier UP and Down



Hand Signals Center Shift



Hand Signals **Wheel Lean**



Hand Signals Carry Position



Hand Signals

Parkline Position



Hand Signals

Blade Pitch Up and Down



Hand Signals

Straighten Heel Cylinder



General Rules of Operation

- **Safety equipment (Hard hats, hearing protection)**
- **Watches, rings, jewelry**
- **Safety position**
- **Grade / Scarify in forward motion only (1st gear)**
- **Hand Throttle (only while blade is on ground)**
- **Backing (use foot throttle)**
- **Differential Lock**
- **360 Walk Around**

REVIEW

- **Controls**
- **Hand signals**
- **General rules of operation**

Summary

QUESTIONS?